THE HEALING ARTS RADIATION PROTECTION COMMISSION

FIFTH ANNUAL REPORT TO THE MINISTER

1985-86

Ministry of Health
Ontario

THE HEALING ARTS

RADIATION PROTECTION COMMISSION

ONTARIO MINISTRY OF HEALTH

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TABLE OF CONTENTS

		Page
I.	**INTRODUCTION**	
1.	Origin of the H.A.R.P. Act and the H.A.R.P. Commission	1
2.	The ALARA Principle in X-ray Diagnosis	3
II.	**SUMMARY OF ACTIVITIES DURING 1985/86**	
1.	H.A.R.P. Guidelines	3
2.	Quality Assurance	6
3.	Review of the Regulations	8
4.	X-ray Safety Courses	8
5.	Review of Qualifications	9
III.	**MEMBERSHIP OF THE COMMISSION**	9
IV.	**DUTIES OF THE COMMISSION**	10
V.	**METHOD OF OPERATION**	10
VI.	**MEMBERSHIP AND MANDATE OF THE ADVISORY COMMITTEES**	12
VII.	**ACKNOWLEDGEMENTS**	14

I. INTRODUCTION

This is the fifth report of the Healing Arts Radiation Protection Commission to the Minister of Health, as required by Section 16(2) of the Healing Arts Radiation Protection (H.A.R.P.) Act, 1980. This report covers the commission's activities during the period April, 1985 to March, 1986.

1. ORIGIN OF THE H.A.R.P. ACT AND THE H.A.R.P. COMMISSION

In 1979, public concern regarding exposure to x-rays, compelled the Minister of Health to establish an Advisory Committee on Radiology, with Dr. R.B. Holmes as Chairman. Included among this Committee's recommendations were the elements of the new x-ray safety legislation, Bill 177. This legislation was passed in 1980 and became known as the Healing Arts Radiation Protection (H.A.R.P.) Act.

The purpose of the H.A.R.P. Act is to promote and ensure the safety of all persons involved in the use of x-rays in the healing arts. The disciplines included under the Act are chiropractic medicine, dentistry, medical radiology, physics, podiatry and radiological technology. The H.A.R.P. Act emphasizes the protection of the patient since the safety of the staff is covered by other legislation.

Protection of the patient implies protection based on mechanical and electrical safety, as well as reducing health risks by minimizing the radiation exposure in every x-ray examination. There is, however, another aspect of patient safety that is of equal importance: a radiograph that fails to provide the required diagnostic information. Such a case represents both wasted radiation exposure and the possibility of undetected life-threatening disease; it is a health hazard to the patient. Thus patient safety must be interpreted to mean the provision of a radiological image of good diagnostic quality, consistent with minimum radiation exposure.

The Act provides for the development of Regulation, intended to promote the safe use of x-rays in the healing arts. The general legal framework established by the H.A.R.P. Act and the Regulations under the Act are as follows:

i) registration and approval of installation of x-ray facilities and equipment;

ii) definition of the classes of person who may prescribe an x-ray examination of a human subject;

iii) definition of the classes of person who may operate x-ray equipment for the purposes or irradiating a human;

iv) appointment by the owner of an x-ray facility of a Radiation Protection Officer (R.P.O.) charged with ensuring that every x-ray machine is maintained in a safe operating condition and with "such other matters" (relating to x-ray safety) "as are prescribed by the Regulations";

v) provision of legal powers to the Director of X-ray Safety (appointed by the Minister) to prevent the unsafe use of x-rays;

vi) establishment of the Healing Arts Radiation Protection Commission to advise the Minister on matters relating to x-ray health and safety, approve training courses for all personnel involved in the use of x-rays, examine such matters as x-ray screening programs and to develop x-ray safety regulations;

vii) establishment of Advisory Committees consisting of representatives from each of the healing arts regulated by the Act as well as radiological technologists and medical physicists to advise the Commission.

The Regulations, promulgated in 1985, take the form of an X-ray Safety Code in which both the standards for equipment performance and the duties of the Radiation Protection Officer are defined.

2. THE ALARA PRINCIPLE IN X-RAY DIAGNOSIS

The International Commission on Radiation Protection (I.C.R.P.) developed an approach known as the ALARA principle which specifies safe use of ionizing radiation. This operating principle in radiation safety specifies that:

- all x-ray exposures to individuals should be kept "As Low As Reasonably Achievable" (ALARA), economic and social factors being taken into account; that is, the procedure must be optimized to reduce the hazard to the patient;

- no x-ray procedure shall be adopted unless its introduction produces a positive net benefit; that is, the examination must be justified;

- the dose equivalent to individuals shall not exceed the limits recommended by the H.A.R.P. Commission for the appropriate circumstances; that is, recognized exposure limits must not be exceeded during the course of the examination.

II. SUMMARY OF ACTIVITIES DURING 1985 - 1986

1. H.A.R.P. GUIDELINES

Over the past year, the H.A.R.P. Commission and its six Advisory Committees have been actively involved in developing Guidelines. These Guidelines complement Regulations 45/84 and 344/84 to the Healing Arts Radiation Protection Act; plus provide information on many related aspects of x-ray imaging.

The basic principles of x-ray imaging are common to all the professions covered by the H.A.R.P. Act. Anyone who uses ionizing radiation for diagnostic purposes should understand the nature of the hazards involved and the risks associated with the procedures or examinations carried out in a given facility.

A primary objective of the Guidelines is to help the health professional render these risks "As Low As Reasonably Achievable". Furthermore, the Guidelines were developed to help the user render the diagnostic quality of every image "As High As Reasonably Achieveable". The Guidelines contain advice and recommendations, but no mandatory requirements.

The Guidelines:

- provide information to the Radiation Protection Officers, assisting them in establishing and maintaining a Quality Assurance Program and in carrying out their other duties, as required by the H.A.R.P. Act and Regulations;

- assist the Radiation Protection Officer, and indeed the entire staff of an x-ray facility, not just to comply with the letter of the X-ray Safety Code, but to do so in a manner that will help raise the standards of x-ray diagnosis and patient safety throughout Ontario;

- address the relationship between the radiation exposure of the patient and the quality of the image, with optimization of the risk/benefit ratio as the objective;

- provide a brief overview of the currently available imaging modalities; ones where graphical representations of body properties, such as anatomy, tissue composition or function, can be obtained;

- address the problem of protecting the patient in x-ray examinations, first from the point of view of prescribing the examination, second during the actual performance of the examination;

- summarize the problems with x-ray safety from the point of view of the operator and other staff participating in the examination;

- indicate what remedial measures can be taken to correct unsatisfactory situations, currently not in compliance with the requirements of the Code;

- define the needs of x-ray users in the area of quality assurance; and

- encourage the users of x-rays for diagnostic purposes, to go beyond the scope of the Act and comply with the ALARA principles.

The preparation of the Guidelines has been co-ordinated by the Commission's Physics Advisory Committee with input from each of the five other Advisory Committees.

The Guidelines will be distributed throughout Ontario to professional and technical organizations, agencies, consumer groups, manufacturers, educational facilities and other interested individuals.

The Act and Regulations, as legal documents, are necessarily written in concise language and do not provide explanations for each section or requirement. The Guidelines are designed to fill this gap by taking the reader through the Regulations, clause by clause, and providing further information as may be needed to understand the basis of the Regulations and the means of compliance. The Guidelines reflect the legal nature of the document; they also facilitate educational comprehension by the public.

The pursuit of this initiative recognizes and reiterates the continued commitment of the Commission and its Advisory Committees for ensuring that Ontario residents can be confident that they are receiving the highest level of safety in all diagnostic x-ray facilities.

2. QUALITY ASSURANCE

Efforts to reduce unnecessary radiation exposure in the healing arts has long been a goal of practitioners, professional societies and the Ministry. In radiography, procedures to achieve this goal were developed in the early 1970's and since then, they have been tested extensively. These procedures are known as "Quality Assurance", (Q.A.).

Quality Assurance is a program of activities, designed to assure that diagnostic imaging is carried out with the maximum benefit to the patient, at a minimum of risk. Essentially, it is a formal monitoring tool, in which specific criteria are assessed according to established standards. The primary objective of the program is to maintain quality of service by means of frequent review. This program relies on professional accountability for success.

The Regulations specify the minimum standards for Q.A./safety programs, depending on the type of facility concerned. Planning and execution of the program are to be left to the Radiation Protection Officer of each facility. The H.A.R.P. Guidelines are intended to assist the RPO in that task.

The H.A.R.P. Act and Regulations have identified Q.A. programs as a mandatory requirement for legislative compliance. Quality Assurance Programs provide a means of monitoring adherence and compliance to the Regulations and Guidelines.

A quality assurance program contains:

- a provision for mandatory programs of peer review and encouragement of continuing education;

- identification of the tasks and tests to be conducted within the facility, how often and by whom;

- a provision for mandatory internal audit of performance within the facility;

A properly implemented and maintained Q.A. program will enable the users of x-rays to achieve reductions in patient dose, improved image quality and cost benefits. These three elements can be achieved by reduction in the number of repeat films; optimization of processing techniques and equipment; standardization of film quality through the establishment and use of technique charts; x-ray equipment operating at optimum specifications; and in-house education in identified problem areas.

The Ministry of Health's X-ray Inspection Service has been instrumental in assisting users of x-ray equipment implement and maintain effective and cost efficient Q.A. programs, by identifying deficiencies with x-ray equipment, incidents of high radiation dose rates and inadequate hazard controls.

In April, 1986, the Ontario Chiropractic Association produced and distributed a manual entitled "X-ray Quality Assurance in Chiropractic", for its members. The Chiropractic Advisory Committee acted in a consultative capacity in regard to this endeavor.

The Chiropody (Podiatry) Advisory Committee has recommended that its members adopt an in-house Q.A. program as opposed to relying on externally provided services. The Ontario Podiatry Association is in agreement with this recommendation and is planning to conduct a course for podiatrists on the topic of Q.A. programs.

The H.A.R.P. Commission is encouraged by the progress made to date in the area of quality assurance, but emphasizes that continuing benefits can only be achieved if Q.A. is maintained as an on-going program.

3. REVIEW OF THE REGULATION

Efforts during the past twelve months have been directed towards review of the Ontario Regulation 45/84, The X-ray Safety Code, which became effective in 1985. A more concentrated focus is planned for this year.

4. X-RAY SAFETY COURSES

Several Advisory Committees have continued to provide upgrading and certification courses to x-ray operators and assistants who are new to the Province.

The Board of Directors of Chiropractic and the Ontario Chiropractic Association jointly sponsored an educational seminar on x-ray safety legislation. Lecturers were members of the Chiropractic Advisory Committee and topics covered included History of X-ray Legislation, the H.A.R.P. Act and Regulations, Risk Factors, Quality Assurance and Chiropractic Peer Review. Approximately 400 of the 630 Chiropractic Radiation Protection Officers in the Province were in attendance.

In response to requests from dental assistants and their employers, the Dentistry Advisory Committee arranged for the Royal College of Dental Surgeons of Ontario to provide upgrading courses to enable individuals entering the Province to obtain assessment of their qualifications and subsequently, certification.

The Ontario Podiatry Medical Association in conjunction with the Chiropdoy (Podiatry) Advisory Committee also provided an x-ray safety course for podiatric assistants. While podiatry assistants are not permitted by the legislation to take x-rays, it was seen as an advantage to have the assistants provided with a basic knowledge of x-rays. This cours, attended by thirty-five assistants, consisted of seventeen didactic hours and an examination.

5. REVIEW OF QUALIFICATION

The Commission and its Advisory Committees have continued to make recommendations regarding upgrades to educational programs, thus ensuring that operators of diagnostic x-ray equipment in Ontario acquire and maintain minimum qualifications.

The members of the Commission and the Advisory Committees have maintained an ongoing review of educational programs, thus ensuring that they provide minimal acceptable levels of knowledge and skill concerning x-ray physics, radiobiology and radiation safety.

III. MEMBERSHIP OF THE COMMISSION

The Commission, its composition, responsibilities and powers were established under the authority of Section 15 of the Healing Arts Radiation Protection Act. The Commission oversees and coordinates an x-ray safety system for Ontario and represents an active and vigorous effort to serve the public interest in the area of radiation protection and safety.

Members are appointed to the Commission by the Lieutenant Governor in Council for a term up to, but not exceeding, six consecutive years. In order to ensure that the Commission functions independently of the providers of x-ray service and of the government, membership is restricted to lay persons who are not in the public service of the Province and who are not and never have been, members of any governing body or registered health discipline.

The five member Commission is supported by six Advisory Committees with membership representing the owners, operators and manufacturers of x-ray equipment.

MEMBERS

Thomas J. Bell (Chairman)	Toronto
Wendy M. Bell (Vice-Chairman)	Marathon
Albert G. Hearn	Toronto
Marguerite M. Marleau	Port Colborne
Richard Pentney	Sudbury

IV. DUTIES OF THE COMMISSION

The Commission was established to:

a) advise the Minister on all matters relating to the health and safety of persons in respect of irradiation by x-rays;

b) oversee the continuing development of an X-ray Safety Code;

c) review the contents of courses in the operation of x-ray machines and x-ray equipment and approve the courses it considers satisfactory;

d) examine, study and report to the Minister on such matters, including health screening programs involving the use of x-rays, as the Minister may refer to the Commission for the purpose; and

e) perform such other duties as are assigned to it by or under this or any other Act.

V. METHOD OF OPERATION

The Commission holds an average of one meeting each month and conducts its business by concensus. When needed, additional formal or informal

meetings are held by the Commission, the Chairmen and Members of the six Advisory Committees.

The Commission also routinely receives briefs from special interest groups and individuals; responds to correspondence and general enquiries, or refers these matters to the appropriate Advisory Committee(s); schedules and receives reports from Advisory Committees on issues referred to them; and submits reports and/or recommendations to the Minister of Health.

In order to assist the Commission with safety in relation to irradiation from x-rays, Advisory Committees are established in six broad areas relating to health disciplines. These include Chiropody (Podiatry), Chiropractic Medicine, Dentistry, Medical Radiology, Physics, and Radiological Technology. In this way, the Commission is able to encourage and develop the communication channels necessary to achieve concensus among its Advisory Committees on important issues. Subject to the approval of the Minister, the Commission may establish additional Advisory Committees, as required, for assistance.

The governing bodies and associations for each discipline specified above, nominate members to their respective Advisory Committee. The Commission reviews the nominations and appoints Committee members. As the public is well represented by the lay members of the Commission, it is not considered necessary to appoint lay members to Advisory Committees, whose tasks are highly specialized and technical in nature.

The Commission establishes each Committee's quorum and other procedural methods where appropriate; it determines the order of priorities, tasks and deadlines.

Again this year, each Commission member took special responsibility for an Advisory Committee and attended Committee meetings from time to time to provide additional support and advice.

The Commission welcomes comments and suggestions on its programs and activities. Individuals or special-interest groups, wishing to make a formal presentation to the Commission on a topic or issue related to x-rays, may write to:

HEALING ARTS RADIATION PROTECTION COMMISSION
Project Coordinator
7 Overlea Boulevard, 6th Floor
TORONTO, Ontario
M4H 1A8

VI. MEMBERSHIP AND MANDATE OF THE ADVISORY COMMITTEES

The six Advisory Committees were established under Section 17 of the H.A.R.P. Act and represent each of the following disciplines:

1. Chiropody (Podiatry)
2. Chiropractic Medicine
3. Dentistry
4. Medical Radiology
5. Physics
6. Radiological Technology

The Committees assist and advise the Commission on:

- educational standards in x-ray safety;
- certification of all operators;
- quality assurance programs required for each class of facility;
- maintenance of appropriate standards for facilities, equipment and operators;
- professional and technological matters related to x-ray safety;
- other matters referred to them by the Commission.

Members

With the exception of the Physics Advisory Committee, membership on each Advisory Committee consists of at least one representative from both

the professional governing body and the voluntary association concerned. In addition, a physicist who has knowledge in matters of diagnostic radiology and is nominated by the Canadian College of Physicists in Medicine, serves on each Committee. These five medical physicists comprise the sixth Advisory Committee.

The following members continued to serve or were appointed by the Commission, effective January 1, 1986:

Chiropractic Advisory Committee

Dr. Robert Thurlow (Chairman)	Hamilton
Dr. Andrew Rainbow (Physicist)	Hamilton
Dr. Robert Wingfield	Burlington

Dentistry Advisory Committee

Dr. George Stirling (Chairman)	Toronto
Mrs. Mary Bondarchuk	St. Catharines
Dr. Donald McFarlane	Toronto
Dr. Michael Pharoah	Toronto
Mrs. Joyce Robinson	London
Dr. John Rowlands (Physicist)	Toronto
*Dr. Sidney Fireman	Toronto
*Dr. John MacDonald	Toronto

Medical Radiology Advisory Committee

Dr. David Hynes (Chairman)	Toronto
Dr. Anthony Bloomfield	London
Dr. Peter Cockshott	Hamilton
Dr. Montague Cohen (Physicist)	Montreal
Dr. Philip Loren	Toronto
Dr. James McSherry	Kingston

Physics Advisory Committee

Dr. Montague Cohen (Chairman)	Montreal
Dr. Aaron Fenster	Toronto
Dr. Andrew Rainbow	Hamilton
Dr. John Rowlands	Toronto
Dr. Martin Yaffe	Toronto
*Dr. John MacDonald	Toronto

Chiropody (Podiatry) Advisory Committee

Dr. David Weston (Chairman)	Kitchener
Dr. Aaron Fenster (Physicist)	Toronto
Dr. Robert Goldberg	Toronto

Radiological Technology Advisory Committee

Mrs. Gail Moffatt (Chairperson)	Sudbury
Mr. Desmond Barnes	Hamilton
Dr. Joel Rubenstein	Toronto
Mr. Terry West	Toronto
Dr. Martin Yaffe (Physicist)	Toronto

*Dr. John MacDonald and Dr. Fireman retired in 1985.

VII. ACKNOWLEDGEMENTS

The Commission wishes to acknowledge the excellent efforts of its Advisory Committees in developing the H.A.R.P. Guidelines.

Research, development and administrative support was provided to the Commission and its Advisory Committees by:

MINISTRY OF HEALTH

Mr. Joseph H. Ritchie
Chief
X-ray Inspection Service

*Ms. JoAnne Colson
Project Coordinator
X-ray Inspection Service

Mrs. Tiina Jarvalt
Project Coordinator
X-ray Inspection Service

*Ms. Colson received a career advancement in November, 1985.

Secretarial support was provided by:

Mrs. Fareeda Virani
Secretary
X-ray Inspection Service

MEDICAL ADVISOR TO THE COMMISSION

Dr. Walter F. Lumsden Toronto

The Commission wishes to thank the retiring members, Dr. John MacDonald and Dr. Sidney Fireman, for the service they were able to provide their Advisory Committees, over the past years. The Commission recognizes the valued contributions bestowed by both of them.

The Commission also wishes to thank Ms. JoAnne Colson; her performance in the role of Project Coordinator, X-ray Inspection Service, has been greatly appreciated.